Generate *more grasp poses* from *synthesized novel views* using radiance fields like *Gaussian Splatting*

Exploiting Radiance Fields for Grasp Generation on Novel Synthetic Views

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Motivation

With an eye-in-hand camera, creating a scene representation for robot manipulation usually requires multiple perspectives, which may require large robot motions and time. Constructing a representation with minimal viewpoints that allows observation from new viewpoints would be advantageous for grasp inference.





Main contributions

- Demonstrating novel view synthesis
 can produce force-closure grasp
 poses in addition to those
 obtained from real viewpoints.
- Showing novel view synthesis can increase grasp coverage in the scene which is the number of objects in the scene for which valid grasp poses could be computed.

Methods

Post-processing of grasp poses: i)
 Non-Maximum-Suppression, ii) pose clustering and top-grasp filtering, iii)

Example scene reconstruction showing camera poses as frustums, all pointing down, **3 real viewpoints** in red, 16 novel viewpoints in blue



none.

- Evaluation: i) number of force-closure

grasp coverage due to novel views.

grasps from novel views, ii) increased

Example force-closure grasp poses

Future directions

Decrease number of real views.
Strategically select novel views.

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